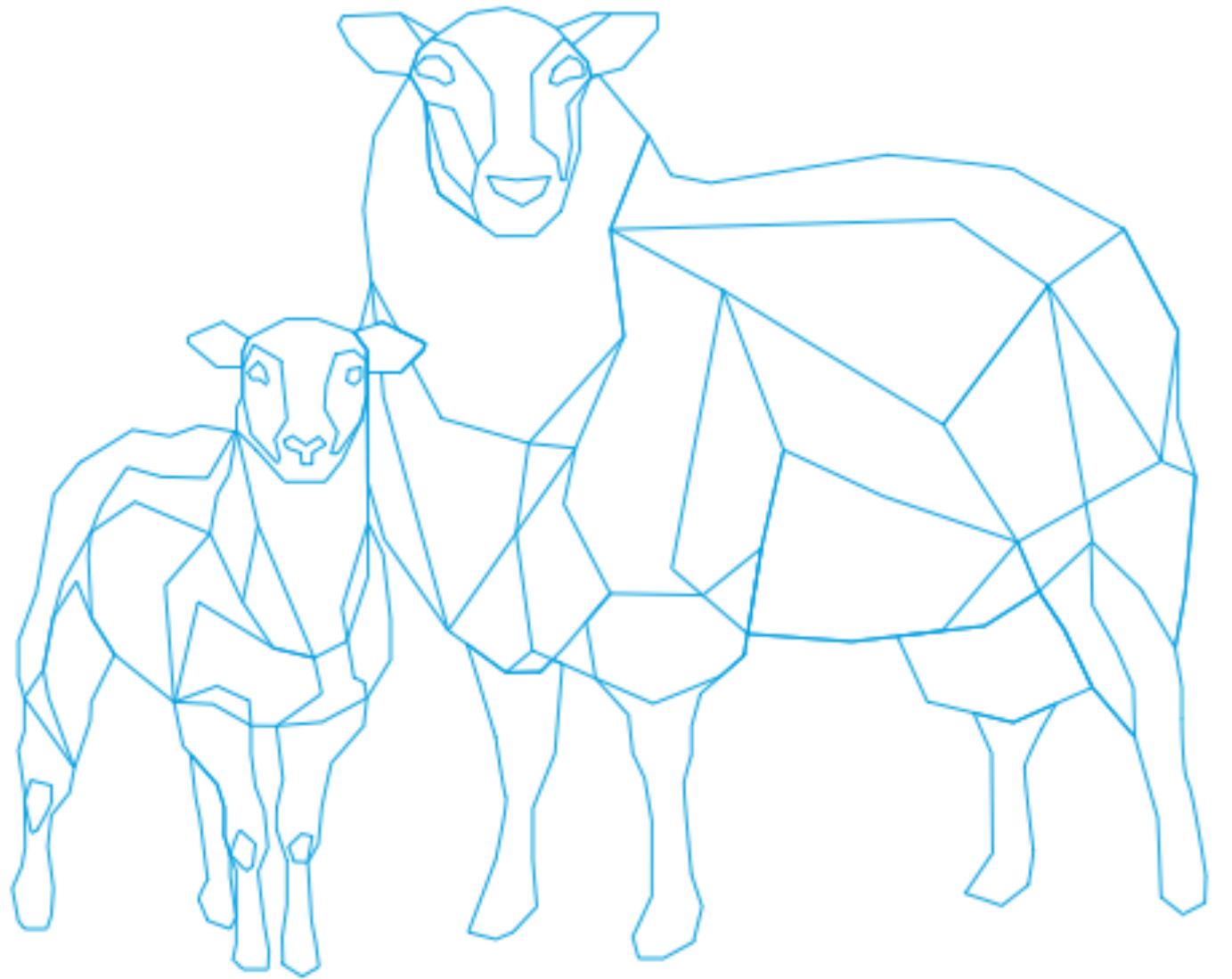


Dairy Sheep Genetics

Peter Gatley & Jake Chardon
March 2016



Introduction

- Peter Gatley
 - Ex General Manager Genetics LIC
 - Founder of Deer Improvement
- Jake Chardon
 - Ex Global CEO of Holland Genetics
 - Geneticist Deer Improvement
 - Geneticist Dairy Goat Cooperative
 - Geneticist Southern Cross Dairy Sheep Technology

- What do we need?
- How do we get it?

Why do we need a better dairy sheep?

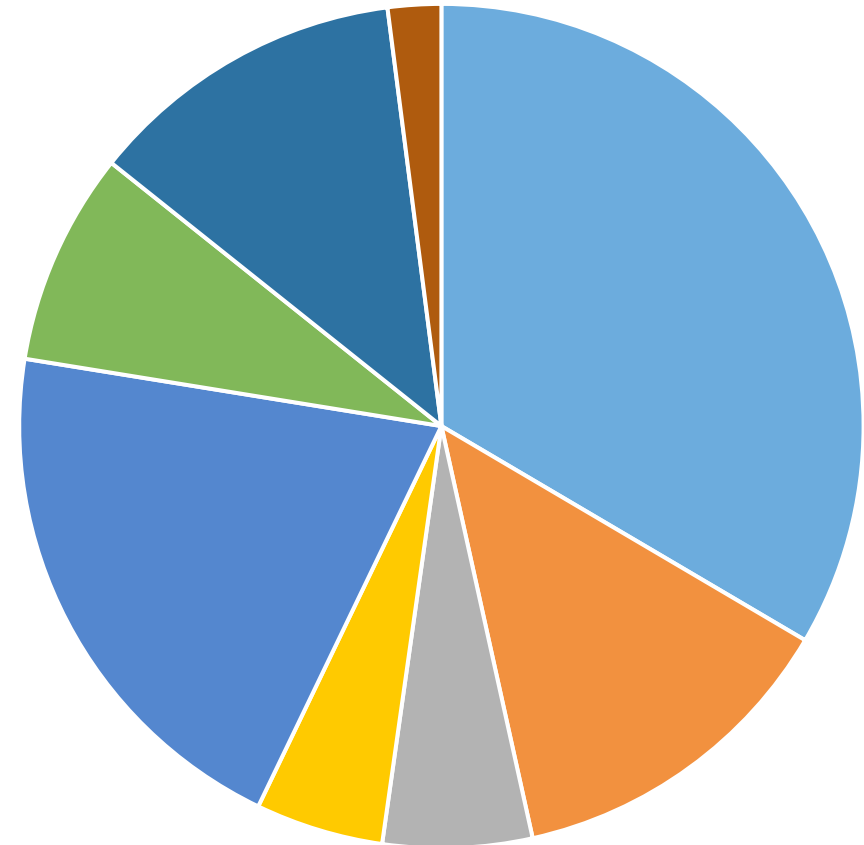
- Fixed costs
 - Farm
 - Farm infrastructure
 - Feed
 - Labour
- Variable output
 - Milk per ewe (100 litres/lactation.....400 litres/lactation)

What traits do we need?

- Milk volume
- Protein
- Milkfat
- Somatic Cell Count (milk quality)
- Liveweight (efficiency)
- Fertility
- Longevity
- Temperament
- Udder conformation

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Economic Index

Breed agnostic
Genetic diversity
Hybrid vigour



Genetics and the farm system



Hybrid system

- Hypothesis
 - 70% grazing, 30% housing
- Dairy sheep need protection
 - Extreme winter weather
 - Summer sun
 - Facial eczema
- Sheep milk is valuable
- Lessons from the bovine and caprine industries



Genetic improvement programme

$$\text{Rate of Genetic Gain} = \frac{\text{Selection Intensity} \times \text{Accuracy} \times \text{Genetic Variation}}{\text{Generation Interval}}$$

Driving genetic gain

- Genetic variation
- Size of population to enable selection intensity
- Accurate objective measurement of key traits
- Large number of observations
- DNA parentage testing and genomics
- Careful mob management to separate genetic and environmental effects
- Progeny testing
- Embryo Transfer to multiply valuable genes from females
- Artificial Insemination to multiply valuable genes from males
- ET and AI to create strong genetic links and disseminate genes

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East Friesian



Lacaune

Pros & Cons

	Local Breeds	East Friesian	F1	Lacaune	NZ Crossbred
Milk	L	H	M	H	H
Longevity	H	L	M	M	H

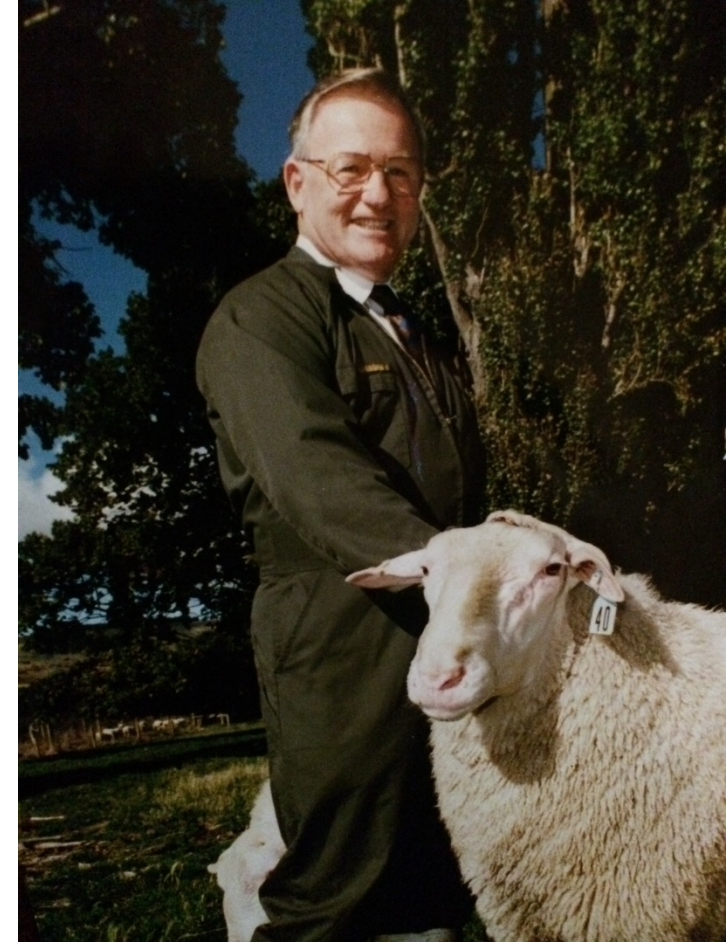
Lacaune

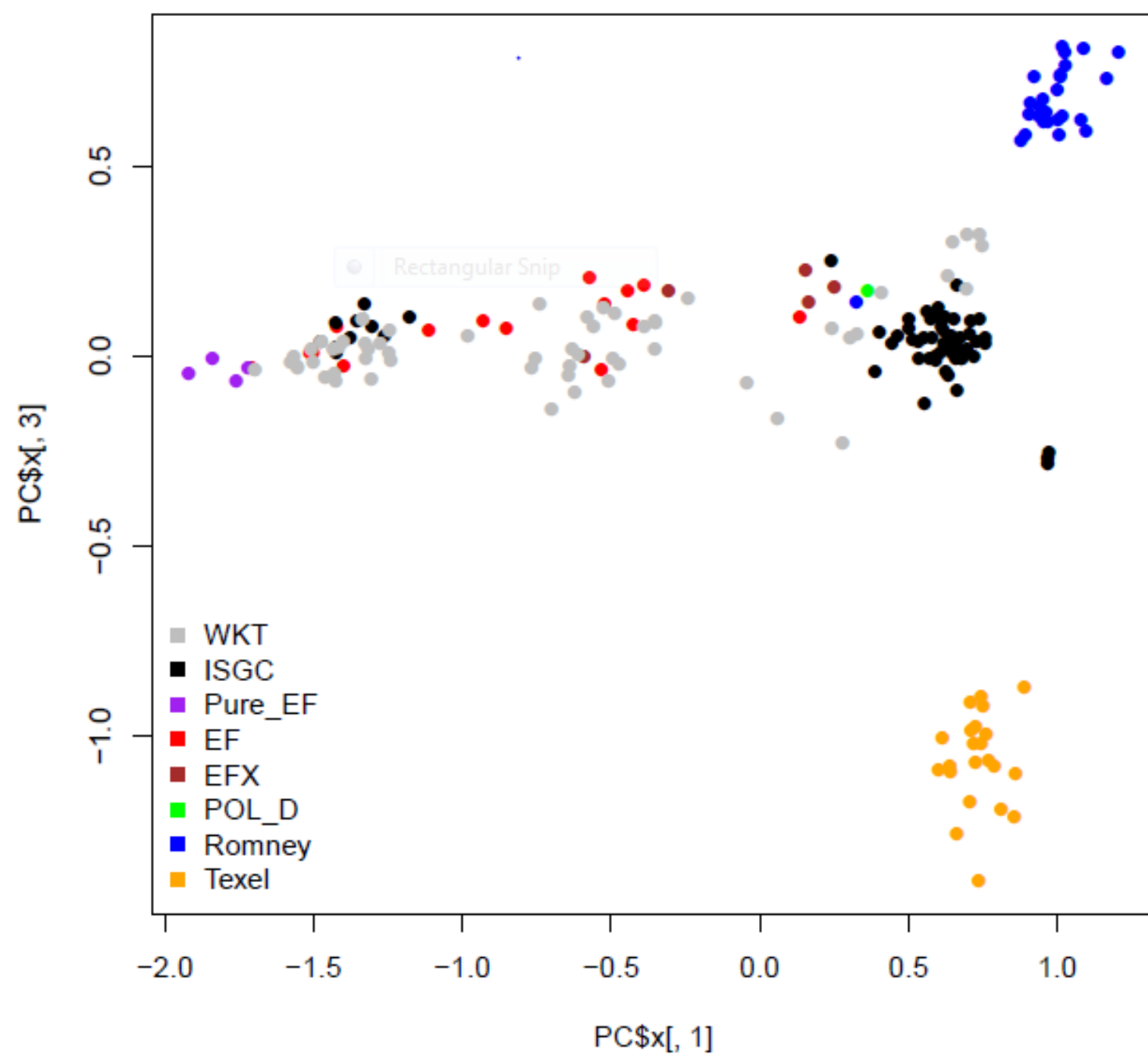
- The largest and most sophisticated dairy sheep breeding programme in the world
- Arrangements in place with French breeding co-operative
- Working with MPI on biosecurity



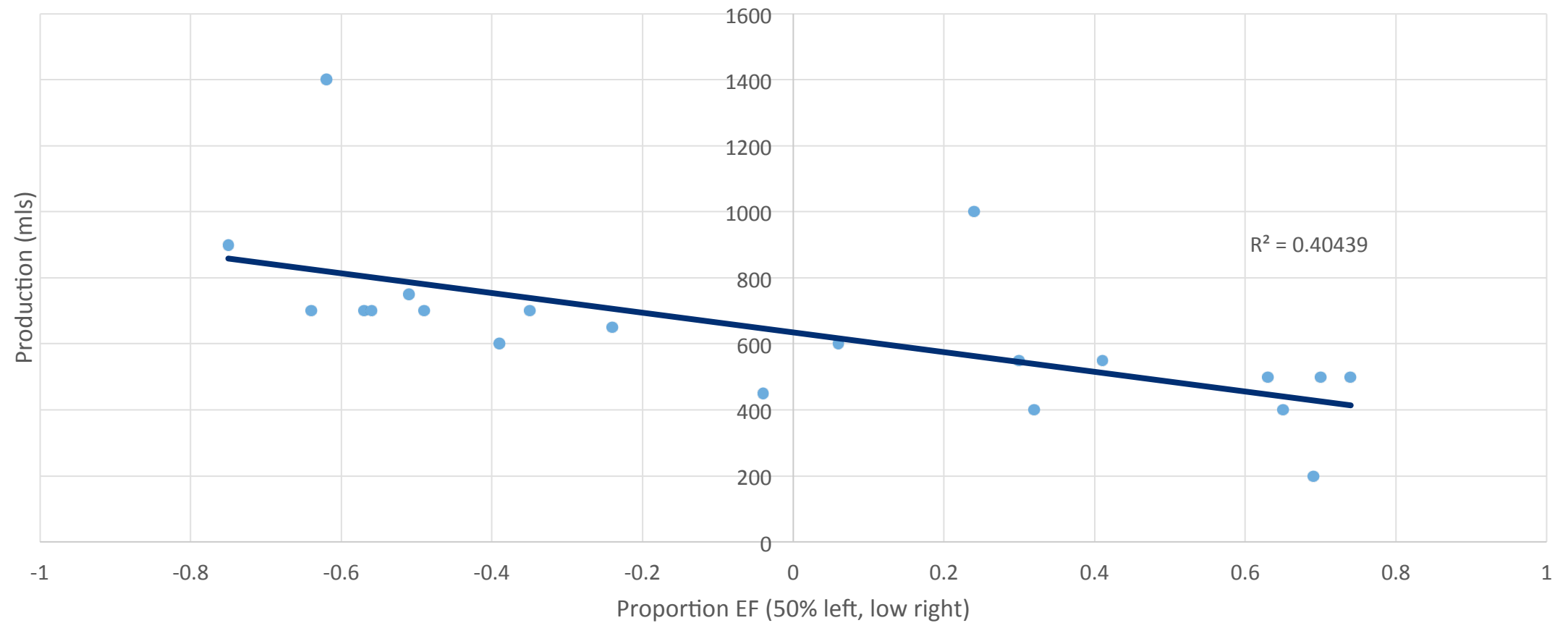
Rapid progress....

- Dr Jock Allison – Dairy Sheep Conference 2015
- 1700 pure East Friesian embryos purchased
- Financial backer found
- Embryos implanted during April at Awapai
- Lambs born September
- EF Rams ready to crossbreed with local breeds NOW
- Ewe hoggets can be milking 2017
- 75% EF hoggets can be milking 2018

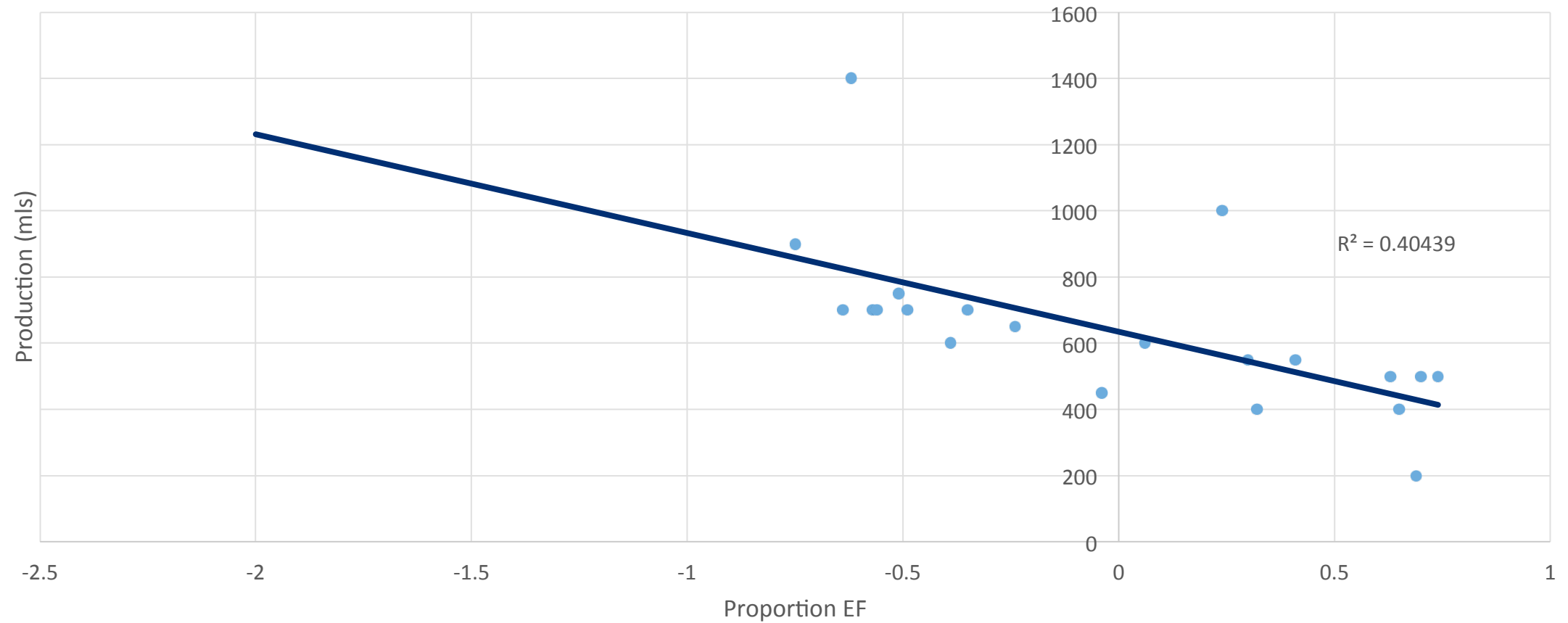


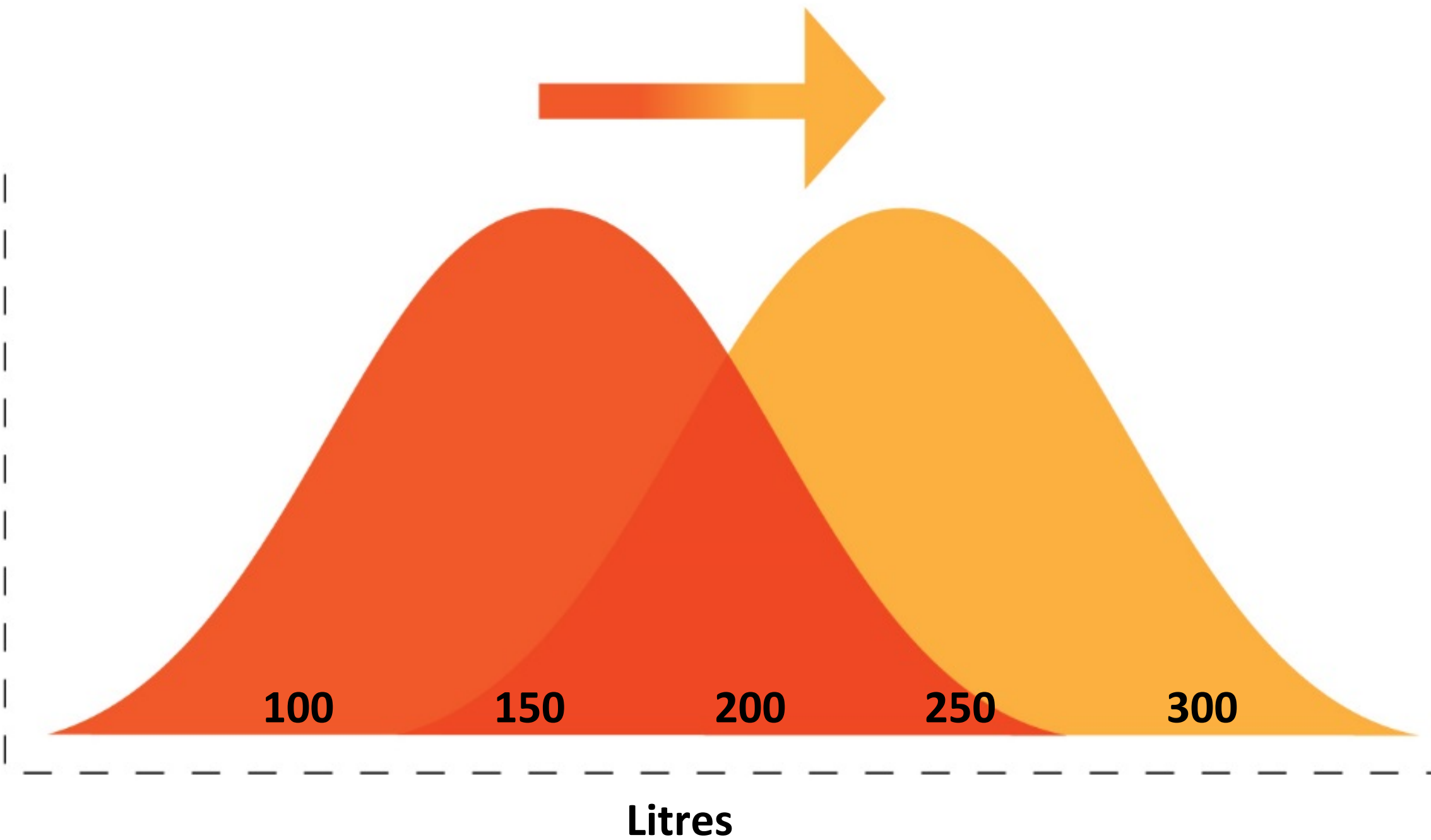


Breed composition vs production



Breed composition vs production





Waikino Station – Western Bays

- Genetics
- Nutrition
- Barn
- Milking parlour



